

## GLOSSARY

### **Absorption**

The movement of dissolved substances (e.g., pollution) into cells by osmosis or diffusion.

### **Adsorption**

The adhesion of dissolved substances to the surface of sediment or on the surface of an organism (e.g., a flatfish).

### **Anthropogenic**

Made and introduced into the environment by humans, especially pertaining to pollutants.

### **Assemblage**

An association of interacting populations in a given habitat (e.g., an assemblage of benthic invertebrates on the ocean floor).

### **BACIP Analysis**

An analytical tool used to assess environmental changes caused by the effects of pollution. A statistical test is applied to data from matching pairs of control and impacted sites before and after an event (i.e., initiation of wastewater discharge) to test for significant change. Significant differences are generally interpreted as being the result of the environmental change attributed to the event. Variation that is not significant reflects natural variation.

### **Benthic**

Pertaining to the environment inhabited by organisms living on or in the ocean bottom.

### **Benthos**

Living organisms (e.g., algae and animals) associated with the sea bottom.

### **Bioaccumulation**

The process by which a chemical becomes accumulated in tissue over time through direct intake of contaminated water, the consumption of contaminated prey, or absorption through the skin or gills.

### **Biota**

The living organisms within a habitat or region.

### **BOD**

Biochemical oxygen demand (BOD) is the amount of oxygen consumed (through biological or chemical processes) during the decomposition of organic material contained in a water or sediment sample. It is a measure for certain types of organic pollution, such that high BOD levels suggest elevated levels of organic pollution.

### **BRI**

An index that measures levels of environmental disturbance by assessing the condition of a benthic assemblage. The index was based on organisms found in the soft sediments of the Southern California Bight (SCB).

### **CFU**

The colony-forming unit (CFU) is a measurement of density used to estimate bacteria concentrations in ocean water. The number of bacterial cells that grow to form entire colonies, which can then be quantified visually.

### **Control site**

A geographic location that is far enough from a known pollution source (e.g., ocean outfall) to be considered representative of an undisturbed environment. Data collected from control sites are used as a reference and compared to impacted sites.

### **COP**

The California Ocean Plan (COP) is California's ocean water quality control plan. It limits wastewater discharge and implements ocean monitoring. Federal law requires the plan to be reviewed every three years.

### **Crustacea**

A group (subphylum) of marine invertebrates characterized by jointed legs and an exoskeleton (e.g., crabs, shrimp, and lobster).

### **CTD**

A device consisting of a group of sensors that continually measure various physical and chemical properties such as conductivity (a proxy for salinity), temperature, and pressure (a proxy for depth) as it is lowered through the water.

These parameters are used to assess the physical ocean environment.

### **Demersal**

Organisms living on or near the bottom of the ocean and capable of active swimming.

### **Dendrogram**

A tree-like diagram used to represent hierarchical relationships from a multivariate analysis where results from several monitoring parameters are compared among sites.

### **Detritus**

Particles of organic material from decomposing organisms. Used as an important source of nutrients in a food web.

### **Diversity**

A measurement of community structure which describes the abundances of different species within a community, taking into account their relative rarity or commonness.

### **Dominance**

A measurement of community structure that describes the minimum number of species accounting for 75% of the abundance in each grab.

### **Echinodermata**

A group (phylum) of marine invertebrates characterized by the presence of spines, a radially symmetrical body, and tube feet (e.g., sea stars, sea urchins, and sea cucumbers).

### **Effluent**

Wastewater that flows out of a sewer, treatment plant outfall, or other point source and is discharged into a water body (e.g. ocean, river).

### **FIB**

Fecal indicator bacteria (FIB) are the bacteria (total coliform, fecal coliform, and enterococcus) measured and evaluated to provide information about the movement and dispersion of wastewater discharged to the Pacific Ocean through the outfall.

### **Halocline**

A vertical zone of water in which the salinity changes rapidly with depth.

### **Impact site**

A geographic location that has been altered by the effects of a pollution source, such as a wastewater outfall.

### **Indicator species**

Marine invertebrates whose presence in the community reflects the health of the environment. The loss of pollution-sensitive species or the introduction of pollution-tolerant species can indicate anthropogenic impact.

### **Infauna**

Animals living in the soft bottom sediments usually burrowing or building tubes within.

### **Invertebrate**

An animal without a backbone (e.g., sea star, crab, and worm).

### **ITI**

An environmental disturbance index based on the feeding structure of marine soft-bottom benthic communities and the rationale that a change in sediment quality will restructure the invertebrate community to one best suited to feed in the altered sediment type. Generally, ITI values less than 60 indicate a benthic community impacted by pollution.

### **Kurtosis**

A measure that describes the shape (i.e., peakedness or flatness) of distribution relative to a normal distribution (bell shape) curve. Kurtosis can indicate the range of a data set, and is used herein to describe the distribution of particle sizes within sediment samples.

### **Macrobenthic invertebrate**

Epifaunal or infaunal benthic invertebrates that are visible with the naked eye. This group typically includes those animals larger than meiofauna and

smaller than megafauna. These animals are collected in grab samples from soft-bottom marine habitats and retained on a 1-mm mesh screen.

### **MDL**

The EPA defines MDL (method detection limit) as “the minimum concentration that can be determined with 99% confidence that the true concentration is greater than zero.”

### **Megabenthic invertebrate**

A larger, usually epibenthic and motile, bottom-dwelling animal such as a sea urchin, crab, or snail. These animals are typically collected by otter trawl nets with a minimum mesh size of 1 cm.

### **Mollusca**

A taxonomic group (phylum) of invertebrates characterized as having a muscular foot, visceral mass, and a shell. Examples include snails, clams, and octopuses.

### **Motile**

Self-propelled or actively moving.

### **Niskin bottle**

A long plastic tube allowing seawater to pass through until the caps at both ends are triggered to close from the surface. They often are arrayed with several others in a rosette sampler to collect water at various depths.

### **Non-point source**

Pollution sources from numerous points, not a specific outlet, generally carried into the ocean by storm water runoff.

### **NPDES**

The National Pollutant Discharge Elimination System (NPDES) is a federal permit program that controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

### **Ophiuroidea**

A taxonomic group (class) of echinoderms that comprises the brittle stars. Brittle stars usually

have five long, flexible arms and a central disk-shaped body.

### **PAHs**

The USGS defines polycyclic aromatic hydrocarbons (PAHs) as, “hydrocarbon compounds with multiple benzene rings. PAHs are typical components of asphalts, fuels, oils, and greases.”

### **PCBs**

The EPA defines polychlorinated biphenyls (PCBs) as, “a category, or family, of chemical compounds formed by the addition of chlorine ( $C_{12}$ ) to biphenyl ( $C_{12}H_{10}$ ), which is a dual-ring structure comprising two 6-carbon benzene rings linked by a single carbon-carbon bond.”

### **PCB Congeners**

The EPA defines a PCB congener as, “one of the 209 different PCB compounds. A congener may have between one and 10 chlorine atoms, which may be located at various positions on the PCB molecule.”

### **Phi**

The conventional unit of sediment size based on the log of sediment grain diameter. The larger the phi number, the smaller the grain size.

### **Plankton**

Animal and plant-like organisms, usually microscopic, that are passively carried by the ocean currents.

### **PLOO**

The Point Loma Ocean Outfall (PLOO) is the underwater pipe originating at the Point Loma Wastewater Treatment Plant and used to discharge treated wastewater. It extends 7.2 km (4.5 miles) offshore and discharges into 96 m (320 ft) of water.

### **Point source**

Pollution discharged from a single source (e.g., municipal wastewater treatment plant, storm drain) to a specific location through a pipe or outfall.

### **Polychaeta**

A taxonomic group (class) of invertebrates characterized as having worm-like features,

segments, and bristles or tiny hairs. Examples include bristle worms and tube worms.

### **Pycnocline**

A depth zone in the ocean where sea water density changes rapidly with depth and typically is associated with a decline in temperature and increase in salinity.

### **Recruitment**

The retention of young individuals into the adult population in an open ocean environment.

### **Relict sand**

Coarse reddish-brown sand that is a remnant of a pre-existing formation after other parts have disappeared. Typically originating from land and transported to the ocean bottom through erosional processes.

### **Rosette sampler**

A device consisting of a round metal frame housing a CTD in the center and multiple bottles (see Niskin bottle) arrayed about the perimeter. As the instrument is lowered through the water column, continuous measurements of various physical and chemical parameters are recorded by the CTD. Discrete water samples are captured at desired depths by the bottles.

### **SBOO**

The South Bay Ocean Outfall (SBOO) is the under-water pipe originating at the International Wastewater Treatment Plant and used to discharge treated wastewater. It extends 5.6 km (3.5 miles) offshore and discharges into about 27 m (90 ft) of water.

### **SBWRP**

The South Bay Water Reclamation Plant (SBWRP) provides local wastewater treatment services and reclaimed water to the South Bay. The plant began operation in 2002 and has a wastewater treatment capacity of 15 million gallons a day.

### **SCB**

The Southern California Bight (SCB) is the geographic region that stretches from Point Conception, U.S.A. to Cabo Colnett, Mexico and encompasses nearly 80,000 km<sup>2</sup> of coastal land and sea.

### **Shell hash**

Sediments composed of shell fragments.

### **Skewness**

A measure of the lack of symmetry in a distribution or data set. Skewness can indicate where most of the data lies within a distribution. It can be used to describe the distribution of particle sizes within sediment grain size samples.

### **Sorting**

The range of grain sizes that comprises marine sediments. Also refers to the process by which sediments of similar size are naturally segregated during transport and deposition according to the velocity and transporting medium. Well sorted sediments are of similar size (such as desert sand), while poorly sorted sediments have a wide range of grain sizes (as in a glacial till).

### **Species richness**

The number of species per sample or unit area. A metric used to evaluate the health of macro-benthic communities.

### **Standard length**

The measurement of a fish from the most forward tip of the body to the base of the tail (excluding the tail fin rays). Fin rays can sometimes be eroded by pollution or preservation so measurement that includes them (i.e., total length) is considered less reliable.

### **Thermocline**

The zone in a thermally stratified body of water that separates warmer surface water from colder deep water. At a thermocline, temperature changes rapidly over a short depth.

### **Tissue burden**

The total amount of measured chemicals that are present in the tissue (e.g., fish muscle).

### **Transmissivity**

A measure of water clarity based upon the ability of water to transmit light along a straight path. Light that is scattered or absorbed by particulates (e.g., plankton, suspended solid materials) decreases the transmissivity (or clarity) of the water.

**Upwelling**

The movement of nutrient-rich and typically cold water from the depths of the ocean to the surface waters.

**USGS**

The United States Geological Survey (USGS) provides geologic, topographic, and hydrologic information on water, biological, energy, and mineral resources.

**Van Dorn bottle**

A water sampling device made of a plastic tube open at both ends that allows water to flow through. Rubber caps at the tube ends can be triggered to close underwater to collect water at a specified depth.

**Van Veen grab**

A mechanical device designed to collect ocean

sediment samples. The device consists of a pair of hinged jaws and a release mechanism that allows the opened jaws to close and entrap a 0.1 m<sup>2</sup> sediment sample once the grab touches bottom.

**Wastewater**

A mixture of water and waste materials originating from homes, businesses, industries, and sewage treatment plants.

**ZID**

The zone of initial dilution (ZID) is the region of initial mixing of the surrounding receiving waters with wastewater from the diffuser ports of an outfall. This area includes the underlying seabed. In the ZID, the environment is chronically exposed to pollutants and often is the most impacted.

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